

NOTES ON THE GENUS *IOSCYTUS* WITH THE
DESCRIPTION OF A NEW SPECIES AND KEY TO SPECIES
(HEMIPTERA: HETEROPTERA: SALDIDAE)

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Abstract.—Recent collections of *Ioscytus* Reuter in the United States have revealed the first known member of the genus from the eastern United States, described here as *Ioscytus chapmani*, new species, and a new distributional record for the United States and first recorded submacropterous form for *Ioscytus tepidarius* (Hodgden), heretofore known only from Mexico. The various habitats of *Ioscytus* species are described, and a key to species and distributional map are included.

Several years ago while collecting in Ohio one of us (CNM) collected a series of an unusual saldid. This represented a great eastward expansion of the genus *Ioscytus* since no other species were known east of Colorado. Comparison with all described species showed this species to be new and it is described here. It possesses a type IIIA stridulatory mechanism (see Polhemus 1977, 1985), unique to the genus *Ioscytus*.

A series of *Ioscytus tepidarius* (Hodgden) was collected in Arizona, and as this species was previously known only from Mexico, this is a new record for the United States. The Arizona specimens differ from Mexican material examined in that they are submacropterous, therefore a description of this form is included. Also included are a key to the known species of *Ioscytus* and a distributional map to help spur an interest in the group. The habitat preferences of *Ioscytus* are unusual within the Saldidae, often species specific, and are discussed.

All specimens are in the collection of the authors (CNM and JTP), American Museum of Natural History (AMNH), U.S. National Museum (USNM) and Oregon State University (OSU). All measurements are in mm.

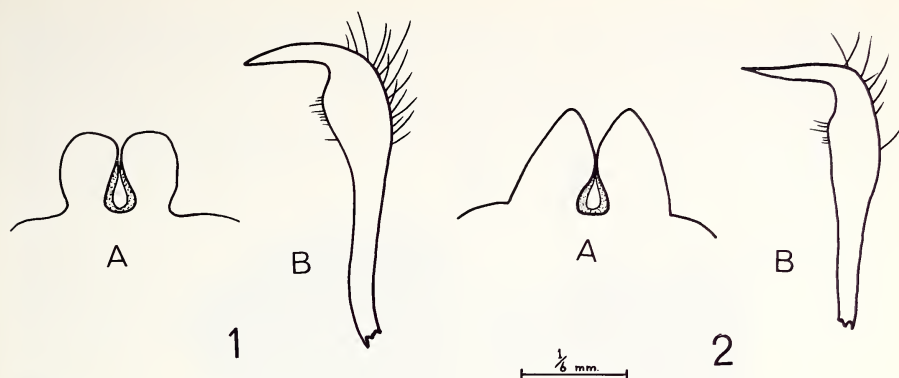
***Ioscytus chapmani*, new species**

Figs. 2-4

Description. Male: Submacropterous, moderate in size, general color black, dorsum glabrous with long erect black setae, last antennal segment leucine except narrowly dark basally.

Head: Black, shining, anteclypeus, postclypeus black with numerous setae; long erect setae on frons and vertex; vertex slightly carinate between eyes. Ocelli round, separated by one and one-half times the width of an ocellus. Eyes reddish-brown, slightly longer than wide (0.60:0.43); rostrum light brown, surpassing the hind coxae.

Thorax: Pronotum black, shining, smooth, covered with long erect black setae; collar encircled with numerous small pits; callus strongly raised with a deep depression medially; lateral margins straight with numerous black setae at anterior margin; callus



Figs. 1, 2. 1. *Ioscytus tepidarius*, ♂: a. parandria (lateral view); b. right paramere (lateral view). 2. *Ioscytus chapmani*, ♂: a. parandria (lateral view); b. right paramere (lateral view).

posteriorly demarcated by a row of small pits; scutellum as wide as long (0.67:0.65), anterior portion raised, posteriorly faintly rugose; venter black, covered with short golden recumbent setae.

Wings: Hemelytra covered with long erect black setae, shining, embolium hyaline, extending to fracture of membrane; secondary hypocostal ridge with strigil; membrane with two closed cells, brown; corium and clavus similar in texture and color.

Extremities: Antennae dark brown except segment I and basal two thirds of segment II reddish flavous; segment IV except narrow dark basal part, luteous; segment II with long setae; third and fourth segments thicker than first two. Antennal measurements: I, 0.38; II, 0.85; III, 0.57; IV, 0.68. Legs reddish flavous.

Genital structures: Capsule small, black; parameres small, processus hamatus sharply pointed; corpus parameris sparsely set with long setae; parandria angulate distally. See Figure 2a, b.

Measurements: Holotype (♂), length 3.50, width 1.70. Allotype (♀), length 3.84, width 1.97. Mean length of 10♂♂, 3.49, Std. Dev. 0.10. Mean width of 10♂♂, 1.72, Std. Dev. 0.06. Mean length of 10♀♀, 3.85, Std. Dev. 0.15. Mean width of 10♀♀, 1.99, Std. Dev. 0.10.

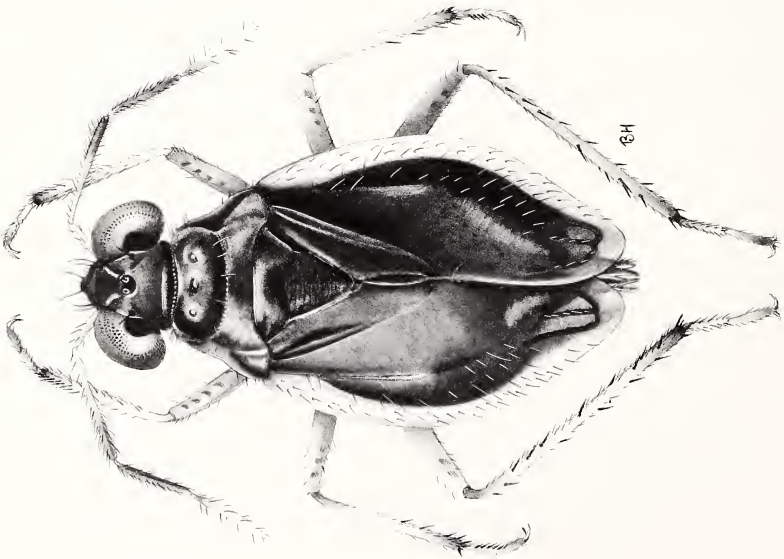
Female: Larger and more robust than male; coloration similar to male; see Figure 3a.

Immature: Last instar black; wing pads, connexivum and lateral margin of pronotum leucine; last antennal segment leucine except for dark narrow band basally, Figure 3b.

Holotype ♂ and *allotype* ♀. OHIO, Washington Co., Veto Lake State Park, IX. 6, 1981, C. N. McKinnon (holotype to be placed in USNM).

Paratypes. 21♂♂, 18♀♀, same data as types (CNM, JTP, AMNH). KENTUCKY (1♀, 1 nymph), Jessamine Co., Marble Creek, IX. 24, 1966, T. C. Barr (OSU). VIRGINIA (1♂), Montgomery Co., 5 mi SE Radford, Meadow Creek, Cty. Rt. 60, VI. 22, 1984, R. Hoffman (AMNH).

Diagnosis. *Ioscytus chapmani* can easily be separated from the other species of *Ioscytus* by the glabrous dorsum and the coloration of the last antennal segment.



The only species that closely resemble *chapmani* are *I. tepidarius* (Hodgden), *I. politus politus* (Uhler) and *I. cobbeni* Polhemus. *Ioscytus tepidarius* differs from *chapmani* in that the texture of the clavus and corium are dissimilar and the clavus is dull, whereas both the corium and clavus of *chapmani* are glabrous. The second antennal segment of both species has long setae and is shaggy in appearance. In both subspecies of *politus* the clavus is sparsely to thickly covered with golden pubescence, and even in submacropterous specimens of *politus flavicosta* Reuter the membrane has more than two closed cells. Specimens of *chapmani* completely lack golden pubescence on the clavus, and have only two closed cells in the membrane. *Ioscytus cobbeni* is probably most closely allied to *chapmani*, but can be easily distinguished by the dull appearance of the clavus and corium; *cobbeni* also differs in that only macropterous forms are known. *Ioscytus chapmani* is allopatric with all congeners, and is the only known species in the eastern United States (Fig. 4).

Etymology. This species is named after Harold Chapman in honor of his contributions to the study of Hemiptera, especially the Saldidae.

Ioscytus tepidarius (Hodgden)

Figs. 1–4

Salda tepidaria Hodgden, 1949:161.

Saldula suttoni Drake and Hussey, 1951:1.

Ioscytus suttoni Polhemus, 1972:143.

Ioscytus tepidarius Polhemus, 1985:139.

Discussion. This species was described on the basis of one specimen from Mexico; the holotype of *tepidarius* in the University of Kansas collection has been studied by one of us (JTP). The type of *suttoni* has also been studied by JTP; this species was synonymized with *tepidarius* by Polhemus (1985). All previous descriptions pertaining to this species by Drake and Hussey (1951), Hodgden (1949) and Polhemus (1972, 1977, 1985) were based on Mexican material known only from the macropterous form. Specimens from northeastern Arizona differ from the Mexican material in that all are smaller and submacropterous; the following description is based on these specimens.

Description. Male: Submacropterous, general color black, oval in shape, dorsum covered with long black erect setae, second antennal segment with long setae, shaggy in appearance.

Head: Black, shining; frons rugulose, orange spot on each side of eye; labrum with orange spot in middle; rostrum dark brown anteriorly, posteriorly half flavous and extending past hind coxae. Vertex and frons covered with numerous black setae of moderate length. Ocelli red, raised and separated by less than the width of an ocellus. Eyes red, almost as wide as long (0.38:0.55). Interocular space equal to the width of an eye (0.37:0.38).

Thorax: Black, shining and smooth; callus raised, with a round depression in middle; sulcus formed by small pits demarcating callus anteriorly and posteriorly;

←

Fig. 3. *Ioscytus chapmani*, habitus: left, adult female; right, immature.

lateral margins slightly reflexed, pile of moderate length setae at anterior edge; posterior lobe rounded. Scutellum as wide as long (0.83:0.83), black, shining and smooth; anterior portion resembles an inverted heart, posteriorly faintly rugose, acuminate distally. Venter black, glabrous; covered with short recumbent golden setae.

Wing: Hemelytra covered with long erect black setae; clavus dull gray except for posterior portion which is black, glabrous; small yellow spot distally on corium near anterior base of second closed cell; embolium leucine to hyaline, extending almost to fracture; black at fracture; membrane dull, black except for outer margins which are leucine to hyaline; with four well developed cells, veins lined with short erect black setae; hind wing well developed, extending past last abdominal segment.

Extremities: Antennal segments dark blackish brown except for yellow distal third of 1st segment; segment 2 longer than remaining three, thickly scattered with long setae, shaggy in appearance; segments 3 and 4 moderately incrassate, thickly set with short dense setae intermixed with scattered long setae. Antennal measurements: I, 0.37; II, 0.80, III, 0.63; IV, 0.67. Legs leucine except for dark brown band on the distal two thirds of femur.

Genital structures: Capsule small, black; parameres small, processus hamatus pointed; corpus paramerus set with long setae; parandria rounded distally. See Figure 1a, b.

Measurements: Mean length of 4♂♂, 4.12, Std. Dev. 0.19. Mean width of 4♂♂, 1.84, Std. Dev. 0.09. Mean length of 4♀♀, 4.62, Std. Dev. 0.09. Mean width of 4♀♀, 2.14, Std. Dev. 0.07.

Female: Similar to male but larger and more robust.

Material examined. (4♂♂, 5♀♀), ARIZONA, Forestdale Trading Post, VII. 3, 1981, C. N. McKinnon (CNM, JTP).

Diagnosis. *Ioscytus tepidarius* most closely resembles *politus politus* and *chapmani*. It differs from *politus politus* in that it lacks the golden pubescence on the pronotum and clavus and the long erect setae of the second antennal segment. The dissimilar texture of the corium and clavus will separate this species from *chapmani*.

KEY TO THE SPECIES OF *Ioscytus* REUTER

1. Clavus with sparse to thickly scattered golden pubescence 2
- Clavus without golden pubescence 5
2. Inner corium and clavus distinctly dissimilar in texture; inner corium with not more than a few insignificant light markings *nasti* Drake and Hottes
- Inner corium and clavus similar in texture; inner corium usually with light markings (some specimens of *franciscanus* without light markings) 3
3. Dorsum not set with long black stiff setae; color black, usually marked with leucine *franciscanus* (Drake)
- Dorsum set with long black stiff setae, color black marked with leucine, usually lightly to heavily marked with red 4
4. Posterior lobe of thorax and scutellum moderately to thickly set with golden pubescence; usually submacropterous *politus flavicosta* (Reuter)
- Posterior lobe of thorax and scutellum never more than sparsely set with golden pubescence; usually macropterous *politus politus* (Uhler)



Fig. 4. Distributional map of the genus *Ioscytus*: $\triangle$ = *politus politus*; $\blacktriangle$ = *politus flavicosta*; $\square$ = *cobbeni*; $\circ$ = *nasti*; $\diamond$ = *franciscanus*; $\blacksquare$ = *chapmani*; $\bullet$ = *tepidarius*; $\blacklozenge$ = *beameri*.

- 5. Size less than 3 mm *beameri* (Hodgden)
- Size greater than 3 mm 6
- 6. Dorsum entirely glabrous; fourth antennal segment leucine except for narrow dark basal band *chapmani* McKinnon and Polhemus
- Dorsum not entirely glabrous; clavus and inner corium dull to faintly shining; fourth antennal segment black 7
- 7. Texture of clavus and corium similar, faintly shining, smooth. Antennal segment II not shaggy, without long setae *cobbeni* Polhemus
- Texture of clavus and corium dissimilar; clavus dull; corium rugose, faintly shining. Antennal segment II with long setae, shaggy *tepidarius* (Hodgden)

HABITAT PREFERENCE

Each species of the genus *Ioscytus* occupies a very specific habitat according to the composition of the substrate and, apparently, prey selection. Most species of *Ioscytus* occupy habitats that seemingly exclude other saldids; thus they are rarely sympatric with other saldid species, even other *Ioscytus* species (except for *cobbeni* and *politus*). This is in marked contrast to other widespread genera such as *Saldula* and *Salda* that commonly have sympatric species. The sympatry of saldid species has been discussed previously by Polhemus (1977, 1985). A brief description of the habitats and some ecological notes are given below by species.

Ioscytus beameri (Hodgden) is at present known only from the type series collected by Dr. R. H. Beamer at Las Cruces, New Mexico. Long ago JTP borrowed his collecting notes which are paraphrased here. The specimens were collected along an irrigation ditch close to the Rio Grande River by pulling up tufts of grass, roots and all, and shaking them vigorously over a white sheet. The bugs were seen only when they ran on the sheet, and were collected in accompaniment with a *Hebrus* species.

Ioscytus chapmani at one locality in Ohio occupies a small grassy seepage area along the banks of a medium-sized lake. This species is positively phototropic in that it was out on sunny days, but took to shelter on cloudy days. The lake was surrounded by an oak-hickory forest within five to ten feet of the bank of the lake. When disturbed, *chapmani* quickly sought the shelter of the forest floor leaf litter. It was only abundant from late August to early September. Earlier collections at the same site in June and July failed to produce any specimens of *chapmani*. In Virginia a single specimen was collected along a marshy area of a small stream in July. This species is only known from the submacropterous form.

Ioscytus cobbeni is distributed from northeastern Colorado to northern Mexico. It prefers small grassy seepages along small streams. In northeastern Colorado this species commonly hides at the base of tall grass blades and is rarely seen in open areas. All specimens collected were macropterous and flew readily when disturbed. This species is prevalent from July to early September.

Ioscytus franciscanus (Drake) is a rare species and our only personal observation is by JTP; in an extensive sphagnum bog near Ft. Bragg, California the bugs occurred only on a small isolated area of wet black earth in the middle of the bog. This bog was surrounded by coniferous forest, all suggesting a highly acidic situation. Data furnished by other workers include wet streamside mud with scattered vegetation, and a marshy meadow, both in Oregon.

Ioscytus politus flavicosta occurs on alkaline substrates along small streams and lakes, and may be found resting on this substrate on bright sunny days. This species is distributed from northeastern Colorado through the northern half of Utah and parts of Nevada. In northern Colorado (Weld Co., Johnstown) this species was for the first time collected with *Ioscytus cobbeni*. After two summers of weekly observations at this site, it became apparent that these two species were occupying different habitats, and the reproductive cycles were not overlapping. *Ioscytus cobbeni* occupied the flat grassy seepage areas of the stream and produced its offspring in July, whereas *politus flavicosta* preferred steep alkaline-encrusted areas on the banks of the stream, and the offspring were dominant in August.

Ioscytus politus politus is common in the far western United States where it usually

occurs on alkaline substrates with scattered vegetation and only rarely in other situations. It is sometimes found running over the exposed damp alkaline crust. One specimen was taken from Tomales Bay, California by JTP in close proximity with *Saldula laticollis* (Reuter), *Saldula villosa* (Hodgden) and *Macrovelia hornii* Uhler; this species mix indicates a complex habitat, and in this particular restricted habitat freshwater springs well up in the intertidal marsh.

Ioscytus nasti Drake and Hottes is an uncommon species for which we have only one personal observation (by JTP). It was collected at high elevation (ca. 2,700 m) in a seep area that ranged from dry to wet and was heavily pocked with cattle hoof prints. The vegetation was low and scattered and the water was apparently strictly fresh with no hint of saline or alkaline influence. Dr. Schuh reports *nasti* from streamside damp mud with scattered vegetation at Sage Hen Creek, California.

Ioscytus tepidarius is distributed from Veracruz, Mexico to central Arizona along the Mexican Plateau. The known distribution is very disjunct, as it is based on only a few collections. The specimens from Arizona were collected in early September, but nymphs were observed at this site in early July suggesting that this species overwinters in the egg state. The Arizona habitat is close to the Mogollon Rim and consists of a small spring-fed stream not more than two feet in width that disappears into the ground within one hundred yards of the spring. The specimens were found in the short grassy vegetation along the banks of the stream. No other saldid species were observed at this locality, the type locality of a recently described hebrid (*Hebrus longivillus* Polhemus and McKinnon) and site of the rediscovery of a rare species of chrysomelid.

ACKNOWLEDGMENTS

We wish to thank Richard Hoffman and R. T. Schuh for furnishing the specimen from Virginia and J. D. Lattin for the specimens from Kentucky and the excellent habitus figures of *Ioscytus chapmani* by Bonnie B. Hall which we have used with his permission.

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Received December 28, 1985; accepted March 17, 1986.